

Brush system

The invention relates to a brush system having a retaining body held by a retaining handle, on which a cleaning element can be fixed in a first functional position.

Such brush systems are known. They are used for many varied cleaning purposes. In particular, these brush systems find use in the cleaning of smooth surfaces, preferably for glass panes. However, other cleaning tasks, particularly in the household sector, can also be accomplished with the brush system.

A cleaning brush is disclosed in DE 199 05 871 A1. The cleaning brush has a retaining handle and a cleaning cap releasably affixed thereto. The retaining handle and the cleaning cap are wedged together by way of a seal, essentially so as not to slip, but in releasable manner. The cleaning cap consists of two beakers set into one another, specifically of an inner beaker and an outer beaker. The inner beaker is connected with the outer beaker by way of a barb, resting against the latter, at its face that faces away from the retaining handle. A cleaning cloth lies around the outer beaker, which cloth lies against the face of the outer beaker and its mantle surface over the entire area and approximately planar, and is introduced into an interstice between outer beaker and inner beaker with its tabs, around the free edge

of the mantle surface of the outer beaker, and lies wedged in place there.

The main disadvantage of this cleaning brush can be seen in that the cleaning cloth always rests against the face of the outer beaker with a single working surface. When the cleaning brush is being used, only the single working surface of the cleaning cloth that rests against the face comes into contact with the surface to be cleaned. As a result, the cleaning cloth is worn only at the single working surface, so that the cleaning cloth as a whole must be disposed of when the single working surface has worn out, whereas the tabs wedged into the interstice have not yet become worn.

It is furthermore disadvantageous that the tabs that are wedged in are unsuitable for further use in the cleaning brush that has been disclosed, although the tabs have not been used yet. Therefore the cleaning cloth must be disposed of completely, although parts of it would still be usable for cleaning purposes, so that a significant proportion of material that could be used is disposed of as waste, placing an unnecessary burden on the environment.

The present invention is based on the task of making available an improved brush system, in which the cleaning element can be used up completely.

According to the invention, this is achieved in that the cleaning element can be transferred from a first functional position into at least one second functional position. Therefore the cleaning element can be used further after a working surface that is assigned to the first functional position has worn out, by means of the transfer into the second functional position, by making available a new, unused working surface, and does not have to be disposed of. Once the working surface that is assigned to the second functional position has been used up, the cleaning element is simply transferred to a third functional position. This transfer of a functional position having a worn working surface into the subsequent functional position, in each instance, having a new, unused working surface, in each instance can advantageously be carried out until the cleaning element has been worn out completely.

So that the cleaning element can be transferred from the first functional position and into the subsequent functional position, in each instance, it is practical if the cleaning element is configured in tube or hose shape and surrounds the retaining body. By means of the tube-shaped or hose-shaped configuration, the cleaning element is rotated about the retaining body in simple manner, whereby the cleaning element always surrounds the retaining body.

It is furthermore provided that the cleaning element rests against the retaining body with elastic bias, and can be wedged in place on the latter by means of the retaining handle. This ensures that the cleaning element is held on the retaining body in the functional position, in each instance, so as not to slip. In this connection, it is advantageous, in the sense of the invention, if the cleaning element has a slightly lesser circumference than the retaining body, thereby further improving the secure and non-slip hold on the retaining body.

A cleaning plush is particularly suitable as a cleaning element for the brush system according to the invention, since this is particularly absorbent and can store cleaning fluid, whereby the cleaning plush is furthermore very robust and demonstrates particularly good cleaning strength.

To wedge the cleaning element between the retaining handle and the retaining body, the retaining body has lateral depressions into which the retaining handle, which is elastically deformable, engages.

According to the invention, the retaining body consists of a stiff, elastic foam material, whereby targeted bending of a working surface of the retaining body can be produced in

advantageous manner. By means of targeted bending of the working surface of the retaining body, the user can control the working surface that rests on the surface to be cleaned, in targeted manner. In addition, the retaining body can advantageously also be made available with working surfaces that have different geometric configurations when viewed in cross-section. To remove stubborn dirt, the retaining body can have a working surface that is rectangular when viewed in cross-section, with two straight working edges. In order to clean edges and corners, it is practical if a retaining body having a triangular working surface, when viewed in cross-section, having a working edge that comes to a sharp point, is used. A retaining body having a working surface that is circular when viewed in cross-section is advantageously suitable for cleaning joins, whereby the retaining body can perform an alternating rolling movement when drawn through the join. In this connection, not only is the bottom of the join cleaned, but also the adjacent join walls.

Furthermore, it is provided that the retaining handle has an  $\Omega$ -shaped configuration, when viewed in cross-section, which can rest against the palm surface in particularly ergonomic manner. To introduce the required pressure for bending the working surface and for guiding the retaining body during its various cleaning tasks, the retaining handle has two pressure ridges that lie

diametrically opposite one another, with reference to its center axis, oriented in opposite directions, which run perpendicular to the retaining body. The fingers of the user can support themselves on these pressure ridges, in advantageous manner, so that a targeted force can be introduced into the retaining body at all times.

In an advantageous further development, an extension that projects perpendicular away from the free ends of the pressure ridges is disposed on these ends, in each instance, which extension runs parallel to the retaining body and is oriented towards the working edge. The retaining body and the cleaning element can be additionally wedged to the retaining handle at the extensions.

The brush system according to the invention is suitable, in excellent manner, for careful vehicle cleaning. It is advantageous that the brush system can be used ideally both for cleaning the exterior, e.g. the windshield of the vehicle, to remove hard-to-clean dirt such as insect bodies or fly feces, etc., and for cleaning the interior of the vehicle, such as window corners or slants, or the interior fittings.

Furthermore, the brush system according to the invention can be used in tremendously multi-faceted manner. It is advantageous that small windows and window frames in the household can be

efficiently cleaned. However, its use for cleaning the interior of a refrigerator is also possible. The brush system rests against surfaces, even rounded surfaces, with its entire area, by means of the stiff but elastic retaining body.

Exemplary embodiments of the invention will be explained in greater detail below, using the drawings. These show:

Fig. 1: a brush system in cross-section,

Fig. 2: a perspective view of the retaining handle,

Fig. 3 and 4: various geometric configurations of a retaining body in cross-section,

Fig. 5: the retaining handle in cross-section, to show how it is bent open

In the individual figures, the same parts are given the same reference numbers, so that in general, they will only be described once.

Figure 1 shows a brush system 1 according to the invention, having a retaining body 3 held by a retaining handle 2. A cleaning

element 4 is affixed to the retaining body 3 in a first functional position 6.

The cleaning element 4 is a cleaning plush, whereby the cleaning element 4 is configured in tube or hose shape and surrounds the retaining body 3. In Figure 1, the cleaning element 4 is shown with hatched lines.

In the embodiment shown in Figure 1, the retaining body 3 has a working surface 7 that is rectangular when viewed in cross-section, having two straight working edges 8, 9. Further advantageous embodiments of the working surface are shown in Figures 3 and 4. In Figure 3, the retaining body 3 has a working surface 11 that is triangular when viewed in cross-section, having a working edge 12 that comes to a point, whereby the retaining body 3 according to Figure 4 has a working surface 13 that is round when viewed in cross-section, with a round working edge 14.

In Figures 3 and 4, in an advantageous further development, the working surfaces 11 and 13 furthermore have working edges 9 that run straight, at first, which make a transition into the working edges 12 and 14. Advantages of this embodiment will be explained in greater detail below.



The retaining handle 2 is  $\Omega$ -shaped when viewed in cross-section, having an insertion opening 15 (Figure 2). Wedging projections 17 are disposed on its inside 16. The wedging projections 17 engage into lateral depressions in the retaining body 3, not shown, with a non-positive and a positive lock, and wedge the cleaning element 4 in between the retaining handle 2 and the retaining body 3. The retaining handle 2 has two pressure ridges 18 that lie diametrically opposite one another relative to its center axis Y-Y. The pressure ridges 18 are oriented opposite one another and run perpendicular to the retaining body 3. In an advantageous further development shown in Figure 1, the pressure ridges 18 have an extension 21, in each instance, on their free ends 19, in each instance. The extensions 21 run parallel to the retaining body 3 and are oriented in the direction towards the working edge 8, 12, or 14. In this connection, it is now particularly advantageous if the working surfaces 11 and 13, as mentioned above, first have the straight working edge 9. The extensions 21 also engage with the retaining body 3 with a non-positive and a positive lock, so that the cleaning element 4 is also wedged in between the extensions 21 of the retaining handle 2 and the retaining body 3.

The retaining body 3 has a neck 22 that follows the working surface 7, 11, 13, in each instance, followed by a head 23 that is configured complementary to the inside 16 of the retaining handle

2. The head 23 can have a slightly smaller circumference than the inside of the retaining handle 2. The lateral depressions, not shown, are disposed in the neck 22.

To assemble the brush system 1, the cleaning element 4 is now first drawn around the retaining body 3. To introduce the retaining body 3 with the cleaning element 4 that surrounds it into the retaining handle 2, the latter is bent open, so that the retaining body 3 with its head 23 can be inserted through the insertion opening 15. An example of bending the retaining handle 2 open is shown in Figure 5. After the head 23 has been introduced into the retaining handle 2, the retaining handle 2 returns to its original position. The retaining handle 2 engages into the lateral depressions of the retaining body 3 with a non-positive and a positive lock, by means of the wedging projections 17. In this way, the cleaning element 4 is wedged in between the retaining body 3 and the retaining handle 2. To transfer the cleaning element 4 from the first functional position 6 into the second or any subsequent functional position, the retaining handle 2 is merely bent open, so that the cleaning element 4 can be freely rotated, since the connection with a non-positive and a positive lock is cancelled out.